

IN THE DRAWINGS

The attached sheet of drawings includes a replacement Figure 8. This sheet, which includes only Figure 8, replaces the original sheet which included only Figure 8.

Attachment: Replacement Sheet

REMARKS

Upon entry of the present amendment, claims 1-16 remain in the application. Of these, claims 1, 8 and 14 are independent.

The applicant's representative thanks the Examiner for his helpful remarks during a brief telephone conversation which took place on November 21, 2005. At that time, the cited prior art reference Hayashi was discussed with respect to the rejection of claim 1. In the telephone conversation, the applicant's representative asked for clarification of how the lever 113 met the limitations recited in claim 1. The Examiner stated that sensor shaft 112, which is coaxial with the rotation axis of the swash plate, has a first end connected to the swash plate (through lever 113 and groove 114), and a second end connected to the sensor. The Examiner further stated that the descriptive term "fitted" at col. 12, line 43 did not imply that lever 113 was unable to move with respect to the groove 114, and thus some misalignment between lever 113 and groove 114 was to be expected.

The above-identified Office Action has been reviewed, the references carefully considered, and the Examiner's comments carefully weighed. In view thereof, the present Amendment is submitted. It is contended that by the present amendment, all bases of rejection set forth in the Office Action have been traversed and overcome. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

IN THE SPECIFICATION

The specification is amended herein to correct a typographical error. In particular, in paragraph 37, the reference number 30a has been replaced with the correct reference number 30b. No new matter is added by this amendment, and the corrected reference number 30b in the specification now corresponds to the reference number 30b shown in Fig. 1.

IN THE DRAWINGS

The applicant has replaced the originally filed drawing sheet, which included only Figure 8, with a replacement drawing sheet. The originally filed drawing sheet is from a related application (co-pending application 10/801,178), and was mistakenly substituted for the correct drawing sheet at the time of filing of the application. The replacement drawing sheet submitted herein includes only Figure 8, and includes additional detail of the rotation connection mechanism 40.

The substitute sheet amending Figure 8 herein is fully supported by the set of drawing figures associated with the applicant's priority document, and by paragraph 61 of the original specification. Moreover, the priority document was effectively incorporated by reference by the priority claim in paragraph 1 of the original specification, under new regulation 37 CFR 1.57(a). Therefore, no new matter has been added by the submission of this drawing sheet including a replacement Figure 8.

IN THE CLAIMS

Claim Rejections – 35 USC 102

In the Office Action, the Examiner rejected claims 1 and 5-8 under 35 USC 102 as being anticipated by Hayashi et al (U.S. Pat. No., 4,916,901). In the rejection, the Examiner states that Hayashi discloses an angle detector 111 connected to the rolling member 22 by a shaft 113 in a groove 114, which allows some axial misalignment.

Further clarification of the Examiner's interpretation of the Hayashi reference was obtained in the above described telephone discussion of November 21, 2005. At that time, the Examiner stated that sensor shaft 112 comprises the claimed rotation connection mechanism since shaft 112, which is coaxial with the rotation axis of the swash plate, has a first end connected to the swash plate (through lever 113 and groove 114), and a second end connected to the sensor.

Applicant's Response

The applicant respectfully disagrees with this rejection since Hayashi does not disclose every feature claimed by the applicant. Upon review of Hayashi, the applicant finds that this reference is directed to a hydraulic continuously variable transmission T which includes an angle detector 111 for detecting an angle of a motor swash plate 20, best seen in Figs. 3 and 10. The angle detector 111 is a rotary potentiometer having a potentiometer shaft 112 oriented in a direction perpendicular to an output shaft 31 of the transmission T. A lever 113 extends from the distal end of the potentiometer shaft 112 in a direction perpendicular to the axis of the potentiometer shaft. The lever 113 is "fitted" within a groove 114 formed in the swash plate holder 22, and transmits a rotation of the swash plate holder 22 to the potentiometer shaft 112.

With respect to the rejection of claims 1 and 8, the applicant submits that Hayashi does not disclose a swash plate tilting angle detector having the claimed rotation connection mechanism. In particular, Hayashi does not disclose a rotation connection mechanism having one end which is situated coaxial to the rolling axis and connected to swash plate, and another end which is connected to the angle detector. That is, the lever 113 of Hayashi (corresponding to the "one end") is connected to the swash plate but is not coaxial to the rolling axis, whereas the potentiometer shaft 112 (corresponding to the "another end") is connected to the angle detector 111.

Moreover, the applicant submits that the rotation connection mechanism of Hayashi would not accurately transmit the movement of the swash plate to the angle detector "even when a rotation axis of a portion of the angle detector connected to the rotation connection mechanism is inclined at an angle with respect to the rolling axis", as claimed. Specifically, if the rotation axis of the potentiometer 111 (that is, the axis of shaft 112) was inclined at an angle to the rolling axis, then the lever 113, which is fixed at a right angle to the distal end of shaft 112, would lie at an angle to the groove 114, and thus would no longer be received therein. As a result, the motion of the swash plate holder 22 would not be transmitted to the lever 113.

In addition, Hayashi discloses that lever 113 is "fitted" within the engagement groove

114, implying that the lever 113 and groove 114 are fit together with no “play” therebetween. Thus, the applicant disagrees with the Examiner’s interpretation that the groove 114 permits some axial misalignment of the lever 113 therein.

With further respect to claim 8, the applicant submits that the rotation connection mechanism disclosed by Hayashi does not include a first connection rod that is fixed to the swash plate coaxially with the rolling axis since lever 113, although fixed to the swash plate, is not coaxial with the rolling axis. Additionally, Hayashi does not include a second connection rod fixed to the rotation detector and movably connected to the first connection rod, since although the potentiometer shaft 112 is fixed to the rotation detector 111, the potentiometer shaft 112 is not “movably” connected to the lever 113. Hayashi is silent as to the exact means by which lever 113 is connected to shaft 112, but as a consequence of the function of these structures it is implied that the connection is a rigid one so that the movement of lever 113 can be accurately transferred to the shaft 112.

However, in view of the Examiner’s broad interpretation of the shaft 112 as the rotation connection mechanism in the rejection of claim 1, the applicant has amended claim 1 to more clearly distinguish the applicant’s invention from that of Hayashi. In particular, claim 1 has been amended to recite that the rotation connection mechanism has one end which is situated coaxial to the rolling axis and which is contiguously connected to the swash plate. This configuration is not disclosed by Hayashi, since shaft 112 is clearly not contiguous with the swash plate, but instead is connected to the swash plate through the lever 113 and the groove 114.

With respect to the rejections of claims 5-7, the applicant agrees that as broadly claimed, Hayashi discloses the features recited in these claims. However, the applicant disagrees with the rejections of claims 5-7 for the reasons stated above with respect to the deficiencies of Hayashi with respect to amended claim 1, from which claims 5-7 depend.

Claim Rejections – 35 USC 103

In the Office Action, the Examiner rejected claims 1-13 under 35 USC 103(a) as being unpatentable over Japan 2001-343,060 in view of Orlando (US 4,536,130), Machine Design, and Snyder (US 3,469,416). The Examiner states that JP '060 discloses a swash plate hydraulic unit as claimed including a swash plate tilting angle detector 121, 212 having an angle detector mounted to the casing, coaxial with the rotating axis, and connected to another end of the rotation connection mechanism, but does not disclose that the rotation connection mechanism transmits the tilting of the swash plate to the angle detector, even when the portion of the angle detector connected to the rotation connection mechanism is inclined at an angle to the tilt axis; wherein the rotation connection mechanism include first and second connection rods connected to the swash plate and angle detector, respectively, and a movable joint connecting the first and second rods together; wherein the movable joint is a pin.

The Examiner further states that Orlando teaches a rotation connection mechanism which allows rotation of the angle detector while allowing a slight axial misalignment between the angle detector and the first element (col. 7, line 12-17).

The Examiner further states that Machine Design teaches that a universal joint can be used to allow misalignment between two connected rotating shafts.

Still further, the Examiner states that Snyder teaches a universal joint having a movable joint connecting first and second connecting rods 18, 22 together, wherein the movable joint is a pin 38.

It is the Examiner's position that since JP '060 discloses a rotation connection mechanism between an angle detector and a coaxial rolling mechanism, since Orlando teaches a need for a rotation connection mechanism that allows minor axial misalignment, since Machine Design teaches that a universal joint is a rotation connection mechanism which allows minor axial alignment, and since Snyder teaches that a universal joint can include a movable pin joint connecting first and second connecting rods, that it would have been obvious to make the rotation connection mechanism of JP'060 include a movable joint connecting first and second connecting rods together wherein the movable joint is a pin for the purpose of allowing slight

axial misalignment as taught by Orlando et al and Machine Design.

Applicant's Response

The applicant respectfully disagrees with the rejection of these claims since a prima facie case of obviousness has not been presented.

The Standard for Obviousness under Federal Circuit Law

Applicant respectfully wishes to call the Examiner's attention to some relevant cases of the U.S. Court of Appeals for the Federal Circuit (CAFC). The CAFC was established in 1982 to bring national standards, and a certain level of conformity and continuity to Federal patent case law. Decisions of the Federal Circuit are relevant and helpful in giving guidance to patent practitioners, as well as to the personnel of the U.S. Patent and Trademark Office. The CAFC has stated that:

In order to determine obviousness as a legal matter, four factual inquiries must be made concerning: 1) the scope and content of the prior art; 2) the level of ordinary skill in the art; 3) the differences between the claimed invention and the prior art; and 4) secondary considerations of nonobviousness, which in case law is often said to include commercial success, long-felt but unresolved need, failure of others, copying, and unexpected results. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966); *Miles Labs., Inc. v. Shandon, Inc.*, 997 F.2d 870, 877, 27 USPQ2d 1123, 1128 (Fed. Cir. 1993).

The U.S. Court of Appeals for the Federal Circuit has said that a reference must be viewed in its entirety, *Gore v. Garlock*, 220 U.S.P.Q. 303 (CAFC 1983), and that it is impermissible to use the claims as a frame, and the references as a mosaic, to pick and choose selected pieces, out of context, to reconstruct the invention, *Northern Telecom v. Datapoint*, 908 F.2d 931 (CAFC 1990).

The U.S. Court of Appeals for the Federal Circuit has also said that that in order to combine references, the Examiner must show some motivation, suggestion, or teaching of the desirability of making the combination, *In re Dembiczak*, 50 USPQ 2d 1614, 1617 (CAFC

1999); and that the use of hindsight, in evaluating patentability, is improper, *In re Werner Kotzab*, 55 U.S.P.Q. 2d 1313 (CAFC 2000); *Gore v. Garlock*, *supra*.

Specifically, in *Kotzab*, *supra*, the CAFC stated:

A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. See *Dembiczak*, 175 F.3d at 999, 50 USPQ2d at 1617. Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome, wherein that which only the invention taught is used against its teacher." *Id.*

Most, if not all inventions arise from a combination of old elements. See *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457 (Fed. Cir. 1998). Thus, every element of a claimed invention may often be found in the prior art. See *id.* However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. See *id.* Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant (citations omitted).

The applicant submits that the above-quoted language of the Court of Appeals for the Federal Circuit has relevance to prosecution of the present application. In particular, the applicant submits that JP '060 discloses (Figs. 1 and 6, paragraphs 44, 45 of a translation of the specification) a hydraulic CVT which includes a sensor 121 which senses an angle of a cam-plate holder 83 through a shaft for detection 122 which extends between the sensor 121 and the cam-plate holder 83. JP '060 also describes (paragraphs 7 and 8, Fig. 7) a prior art device which includes a detection sensor 212 for detecting an angle change of a cam plate 204 by means of a shaft for detection 213. As discussed in the background section of the applicant's specification, both configurations described in JP '060 include a sensor in which a single, rigid revolution detection axis (corresponding to the axis of the shaft for detection 122, 213) needs to be precisely aligned with the axis of rotation of the swash plate in order to provide accurate angle detection.

The disclosure of Orlando, which is directed to an indicator device for a helical screw rotary compressor, includes a coupling device 212 for coupling a first shaft 146 to a shaft 214 of an angle detector 36, wherein the shafts 146, 214 may be slightly misaligned. Although the applicant agrees that Orlando teaches a coupling mechanism for slightly misaligned coaxial shafts, the applicant does not agree that the teaching of Orlando makes obvious a modification of JP '060 for the following reasons:

First, the applicant submits that it would not be obvious to apply a teaching from a reference directed to an indicator device for a helical screw rotary compressor for a refrigeration system to a hydraulic continuously variable transmission for a motorcycle. According to the MPEP section 2141.01(a), in order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). See also In re Deminski, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); In re Clay, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992). The cited prior art references are from two completely disparate fields of endeavor, and thus it would not be obvious to look to a refrigerator compressor for a teaching for a motorcycle transmission.

Second, the prior art JP '060 shows a single, rigid shaft for detection connected to the swash plate along the axis of rotation of the swash plate. Orlando provides a teaching of *coupling* a first shaft, whose angle is to be measured, to a second shaft of an angle detector using a friction-fit flexible tube extending between the respective ends of the two shafts, but Orlando does not disclose coupling a shaft to a plate along a rotation axis. The applicant notes that there is no teaching provided by either JP '060 or Orlando to modify the single shaft of JP '060 into

two separate shafts and then provide a coupling therebetween. Thus, the applicant submits that modification of JP' 060 by the teachings of Orlando do not result in a structure which makes obvious the applicant's invention, since Orlando does not teach coupling a shaft to a plate, and neither reference teaches segmenting of a single shaft into two shafts. Thus, the teachings of Orlando are not reasonably pertinent to the particular problem with which the inventor was concerned, as is required under the standard for application of the reference in an obviousness-type rejection.

Third, the applicant submits that there is no suggestion provided in Orlando or in JP '060 for modifying the single, rigid shaft for detection of JP '060 into a plural shafts coupled together using a coupling member, as taught by Orlando. As discussed above, the courts have determined that in order to combine references, the Examiner must show some motivation, suggestion, or teaching of the desirability of making the combination. The applicant contends that modification of JP '060 to include a segmented, coupled shaft is not suggested or disclosed in the references, and further, that such a modification would lead to less accurate angle measurement in the structure of JP '060.

As regards the modification of JP '060 in view of Orlando, and further in view of Machine Design, although the applicant agrees that Machine Design discloses the use of a universal joint to allow misalignment between two connected rotating shafts, the applicant disagrees that it would be obvious to modify the references as described by the Examiner since Machine design teaches away from such a modification. In particular, Machine Design (page 168) states that "Universals...are generally not used for connecting collinear shafts. Instead they are used where a deliberate angle is desired."

The Court of Appeals for the Federal Circuit has established that a prima facie case of obviousness can be rebutted if the applicant can show ‘that the art in any material respect taught away’ from the claimed invention. *In re Geisler*, 116 F.3d 1465, 1469, 43 USPQ2d 1362, 1365 (CAFC 1997). “A reference may be said to teach away when a person of ordinary skill, upon reading the reference,...would be led in a direction divergent from the path taken by the applicant.” *Tec Air, Inc. v. Denso Mfg. Mich. Inc.*, 192 F.3d 1353, 1360, 52 USPQ2d 1294, 1298 (CAFC 1999), *In re Haruna*, 249 F.3d 1327; 58 USPQ2d 1517 (CAFC 2001).

In the present application, by teaching away from the applicant’s claimed structure, Machine Design’s clear preference for not using a universal joint for joining collinear shafts provides evidence of non-obviousness of the applicant’s invention. More specifically, since the single, rigid sensor shaft of JP ‘060 is modified by Orlando to comprise two substantially co-axial shafts (see Orlando’s Fig. 4) coupled by a coupling member, it would not be obvious to replace the coupling with a universal joint since the two shafts of Orlando, although accommodating a slight misalignment, are substantially co-linear.

As regards the modification of JP ‘060 in view of Orlando and Machine Design, and further in view of Snyder, although the applicant agrees that modification of a general universal joint to include a pin-type universal joint as taught by Snyder is reasonable, the applicant disagrees that modification of JP ‘060 and Orlando to include a universal joint is obvious, for the reasons stated above.

In view of the foregoing, the applicant submits that a prima facie case of obviousness has not been presented in the rejection of claims 1-13 under 35 USC 103(a), and therefore requests that the Examiner's preliminary position in the Office Action be reconsidered and withdrawn.

Other Matters

New claims 14-16 are added herein. New independent claim 14 recites the features of the applicant's claims 1-3 and adds a further limitation thereto. In particular claim 14 recites that the pin is surrounded by the transmission housing. New claim 16, which depends from claim 10, recites a similar limitation. These features are fully supported in the specification (see paragraphs 61-63) and drawings (Figs. 8 and 9), and thus adds no new matter to the application. Moreover, this feature is not suggested or disclosed by the cited prior art references.

New dependent claims 15 and 17 are directed to the orientation of the electrical connector for the angle detector. The electrical connector is described at paragraph 61 of the specification and this feature is clearly shown in Fig. 8. Thus no new matter is added to the application. Moreover, this feature is not suggested or disclosed by the cited prior art references.

CONCLUSION

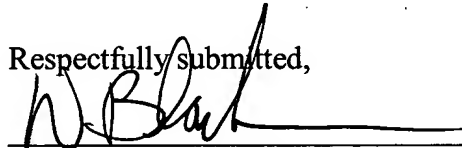
In conclusion, applicant has overcome the Examiner's rejections of record. While applicant has considered all of the references of record, it is respectfully submitted that the continuously variable transmission as defined by the present claims, is believed to be allowable over all of the prior art of record.

If the Examiner is not fully convinced of the allowability of all of the claims now in the application, applicant respectfully requests that he telephonically contact applicant's undersigned representative to expeditiously resolve prosecution of the application.

Favorable consideration is respectfully requested.

Carrier, Blackman & Associates
24101 Novi Road, Suite 100
Novi, Michigan 48375
December 12, 2005

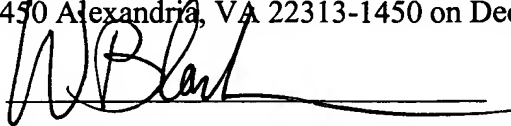
Respectfully submitted,



William D. Blackman
Attorney for Applicant
Registration Number 32,397
(248) 344-4422

CERTIFICATE OF MAILING

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